Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A method of improving sensitivity in the demodulation of a received signal by a receiver over an arbitrary measurement time epoch, said method comprising the steps of:

- correlating said received signal with a local replica of pseudo noise code in a coherent fashion over a plurality of time intervals in said time epoch creating a correlation signal;
- creating a trellis of evenly distributed phase state nodes at each time interval, said creating step comprising:
  - defining a plurality of phase states representing [[~~the~~]] phases evenly quantized over 0 to 360 degrees;
  - defining possible state transitions from and to each phase state node;
  - creating paths between phase state nodes in one time interval and phase state nodes in another time interval according to said possible state transitions;
  - assigning a transition probability to each path; and

- creating a likelihood metric for each path based on a measured phase of the ~~received~~ correlation signal and the transition probability for the path, said measured phase of the ~~received~~ correlation signal having a random process approximated utilizing a discrete Markov process; and

- utilizing a Viterbi algorithm on said trellis to perform a maximum likelihood estimation of a phase trajectory of the correlation signal with said quantized resolution of phase states over 0 to 360° throughout the measurement time epoch.

2. (original) The method of claim 1, wherein the Markov process is a first order Markov process.

3. (original) The method of claim 1, wherein the possible state transitions and the probability of the paths are assigned to reflect properties of said receiver.

4. (original) The method of claim 3 wherein the step of creating possible state transitions for each node is performed based on a known phase slew rate limitation of said receiver.

5. (original) The method of claim 4, wherein the known phase slew rate limitation is calculated from the instability of a radio frequency local oscillator in said receiver.

6. (original) The method of claim 1, wherein the received signal is a direct sequence spread spectrum signal.

7. (original) The method of claim 1, wherein the received signal is a global positioning system (GPS) coarse/acquisition LI signal generated by a space vehicle (SV).

8. (original) The method of claim 4, wherein the received signal is a global positioning system (GPS) coarse/acquisition LI signal generated by a space vehicle (SV).

9. (original) The method of claim 1 wherein the received signal is a code-division multiple access (CDMA) pilot signal.

10. (original) The method of claim 8, wherein the GPS SV creates a doppler shift in the phase trajectory, and the known phase slew rate limitation is calculated from the uncertainty of the GPS SV doppler shift.

11. (original) The method of claim 8, wherein the known phase slew rate limitation is calculated from both the instability of a radio frequency local oscillator in said receiver and the uncertainty of the GPS SV doppler.

12. (original) The method of claim 1, wherein the likelihood metric is created based on an approximation of a probability distribution function of the phase of said correlation signal.

13. (original) The method of claim 12, wherein the approximation is to model the probability distribution function of the phase as a periodic gaussian pulse on top of a constant function.

14. (original) The method of claim 1 wherein said receiver is a mobile receiver.

15. (currently amended) A receiver for improving the sensitivity in the demodulation of a received[[~~ing a~~]] direct sequence spread spectrum signal, said receiver comprising:

- an antenna for receiving the direct sequence spread spectrum signal;
- a downconverter for downconverting the received signal, producing a downconverted signal;
- an analog to digital converter to convert the downconverted signal to a digital signal;
- a despreader for despreading and coherently correlating the digital signal to a known signal, creating a despread signal; and
- a processor for applying a Viterbi algorithm to a trellis created for the despread signal, the processor:
    - o breaking the despread signal into time intervals;

- creating the trellis of evenly distributed phase state nodes at each time interval by:
  - defining a plurality of phase states representing the phases evenly quantized over 0 to 360 degrees;
  - defining possible state transitions from and to each phase state node;
  - creating paths between phase state[[~~s~~]] nodes[[]] in one time interval and phase state nodes in another time interval according to said possible state transitions;
  - assigning a transition probability to each path; and
  - creating a likelihood metric for each path based on a measured phase of said ~~received~~ despread signal and the transition probability for the path, the measured phase of the despread signal having a random process approximated by a Markov process; and
- utilizing the Viterbi algorithm on said trellis to perform a maximum likelihood estimation of a phase trajectory of the despread signal with said quantized resolution of phase states over 0 to 360° throughout the time interval.

16. (original) The receiver of claim 15, wherein the Markov process is a first order Markov process.

17. (original) The receiver of claim 15, wherein the received signal is a global positioning system coarse/acquisition (C/A) LI signal generated by a space vehicle (SV).

18. (original) The receiver of claim 15, wherein the received signal is a CDMA pilot signal.

19. (original) The receiver of claim 15, wherein the receiver is a mobile receiver.

20. (original) The receiver of claim 15, wherein the known signal is a GPS C/A L1 signal.

21. (original) The receiver of claim 20, wherein the possible state transitions and the probability of the paths are assigned to reflect properties of said receiver.

22. (original) The receiver of claim 21, wherein the possible state transitions for each node are based on a known phase slew rate limitation of said receiver.

23. (original) The receiver of claim 22, wherein the known phase slew rate limitation is calculated from the instability of a radio frequency local oscillator in said receiver.

24. (original) The receiver of claim 17, wherein the GPS SV creates a doppler shift in a phase trajectory of said received signal, and the known phase slew rate limitation is calculated from the uncertainty of said GPS SV doppler shift.

25. (original) The receiver of claim 17, wherein the possible state transitions for each node are based on a known phase slew rate limitation of said receiver.

26. (original) The receiver of claim 25, wherein the known phase slew rate limitation is calculated from both the instability of a radio frequency local oscillator in the receiver and the uncertainty of the GPS SV doppler.

27. (original) The receiver of claim 15, wherein the likelihood metric is created based on an approximation of a probability distribution function of the phase of said despread signal.

28. (original) The receiver of claim 27, wherein said approximation is to model the probability distribution function of the phase as a periodic gaussian pulse on top of a constant function.

29. (new) A wireless mobile device comprising the receiver of claim 15.